

PATENT CLAIMS

1. The procedure for injection molding multi-layer plastic products, stated in full according to the initial patent application P-571/02, *wherein* firstly the layer (1) is injection molded with ribbed protrusions (12), and in a closed structure, the segments (1', 1'') of the first layer (1), with an opening (11) shaped with a solid core or in any other known way, are joined into a skeleton via inlets (13) with coupling or any other known way, first shaped layer (1) formed thereby is then precisely positioned into the next mold, and over the whole, or a part of the outer surface another layer (2) is injection molded, whose opposite ribs (21) fill in the cavities between the ribs (12), and the ribs (22) now protrude out of the surface of layer (2); whereby the layer (1) is over-molded by the layer (2) and then positioned into the next mold and the whole procedure is repeated until the desired layer (n) is injection molded whose ribs (n1) fill in the cavities or indentations of the previous layer, while on the surface of the layer (n) grooves (nu) are formed; the layer (n), which includes all the previous ones, is positioned in the last mold where the covering, finishing thin layer (p) is injection molded, whose ridges (pi) fill-in the grooves (nu) of the layer (n), while the outer surface of the layer (p), i.e. of the product, is smooth, or coarse if necessary, or profiled in a desired pattern or design.
2. The injection molding procedure for the multi-layer plastic products of open structure, according to the claim 1 *wherein* the first layer (1) with its ribbed protrusions (12) is over-molded by the layer (2), and the procedure is repeated until the desired layers (n), or the covering/finishing layer (p) is completed where the (1+ n) layers are made as thin layers (ts), or as thick layers (ds) and are dictated by the technical requirements and technological requirements and characteristics, whereas the covering/finishing layer (p) is molded according to the aesthetical requirements.
3. Multi-layer plastic product design, according to the claims 1, 2 *wherein* the top surface and bottom surface of the thin layers (ts) are molded as smooth or with protrusions (tsi) or with grooves (tsu), and/or in any combination of the stated protrusions and grooved surfaces.

4. Multi-layer plastic product design according to the claims 1 + 3 *wherein* the top surface and bottom surface of the thick layer (ds) are molded smooth or with protrusions (dsi) or with grooves (dsu), with ribs (ds1, ds2), or in any of the combinations of the aforementioned.

5 5. Multi-layer plastic product design according to the claim 4 *wherein* the protrusions or ribs (tsi, dsi) and indentations or grooves (tsu, dsu) made in the shape of a circle, square or any other geometrical figure are distributed in a chess board pattern, diagonally or in any other shape, form or fashion.

10 6. Multi-layer plastic product design according to the claim 5 *wherein* the ribbed protrusions (ds1, ds2) are the cross-sections of the square, rectangle or any other geometrical figure distributed upon the surfaces of the layers (1÷ n) in the shape of straight parallel ribs, arbitrarily shaped, or criss-crossed in a net-like pattern (m) or any other surface distribution.

15 7. Multi-layer plastic product design according to the claim 1 *wherein* the segments (1', 1'') of the first layer (1) are joined in a separable manner along the inlet (13) where an 'O' ring is inserted (14), or with coupling, or in an inseparable manner, by gluing, melting, friction-welding or ultrasonic welding in the inlet (13) joining point.